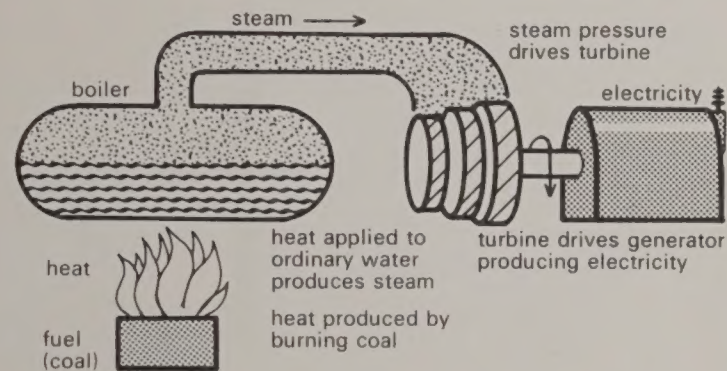


conventional power plant



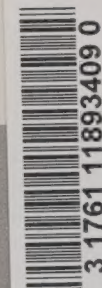
Visiting Lakeview Generating Station

Lakeview Generating Station is located off Highway 2 on the western outskirts of Toronto. Tours are provided by advance request only.

For additional information write or phone
Ontario Hydro Public Relations Division
620 University Avenue
Toronto 2, Ontario

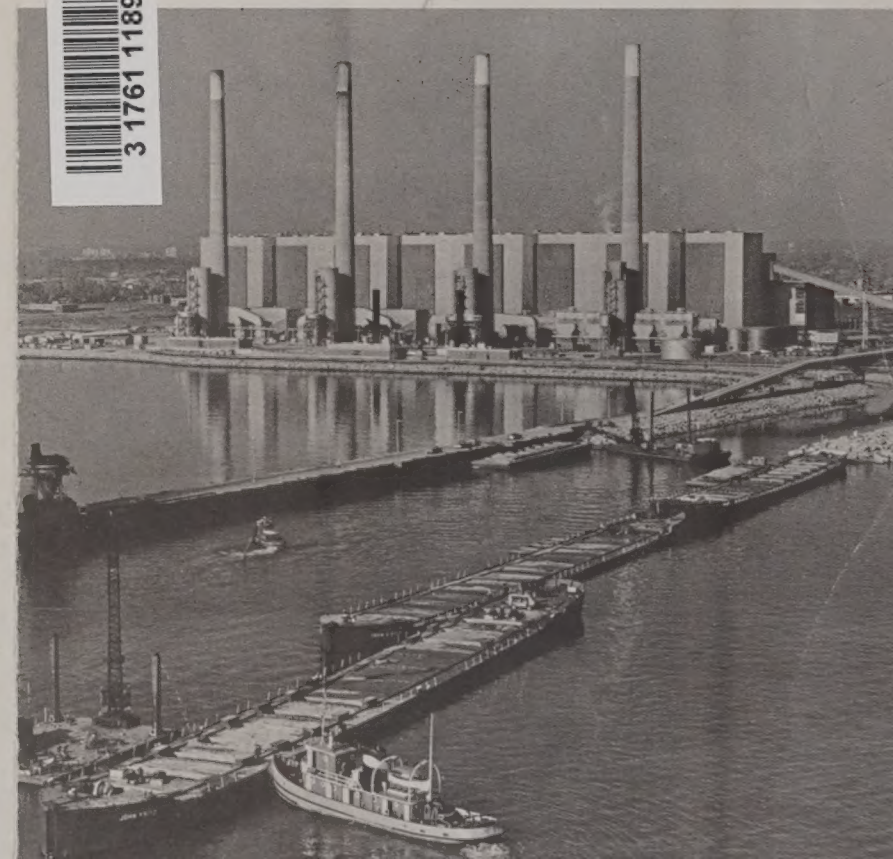
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Lakeview generating station

Hydro Electric Power
Commission Government
Publications



Electricity From Coal

Electricity is produced when a magnet spins inside a coil of wire in a generator. In a hydraulic generating station, the spinning power is provided by turbines driven by falling water. Thermal stations, such as Lakeview, use super-hot jets of high pressure steam to provide the propelling force for the turbines.

At Lakeview, coal stored on site is transferred into the plant by conveyors, ground into a fine powder for faster combustion, and blown into the furnace where it immediately ignites and produces heat.

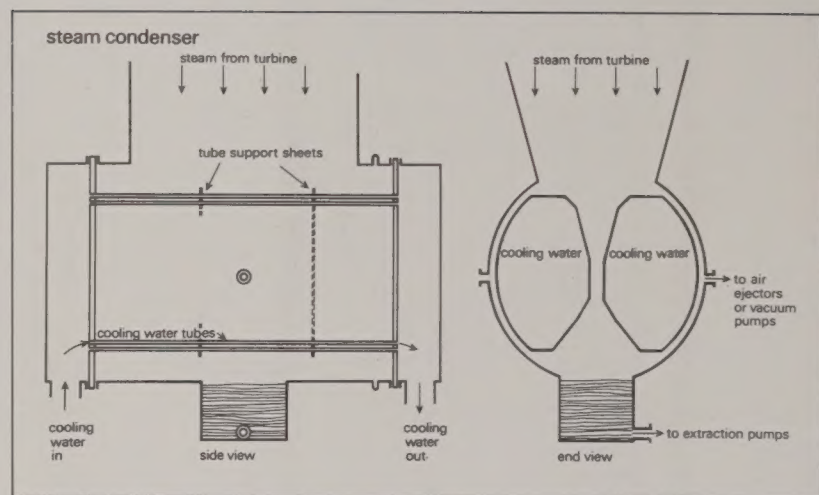
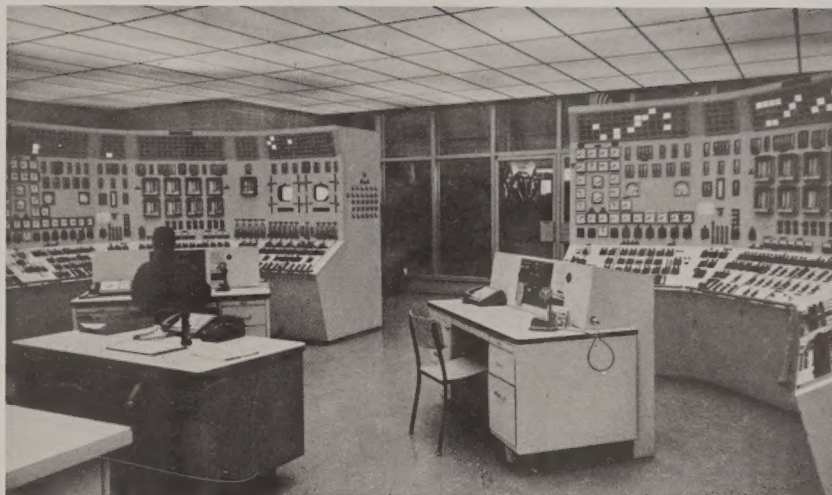
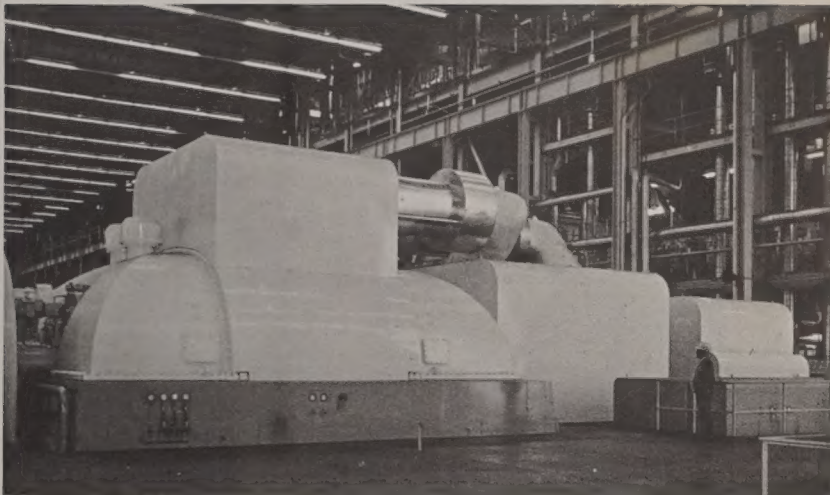
Water circulating through an intricate system of tubes surrounding the furnace is boiled by the heat and converted to steam. After passing through the hot furnace gases, the steam is superheated to 1000°F and fed to the first cylinder of the turbine at a pressure of 2,350 lbs. per sq. inch. Here some of its energy is converted to mechanical work in rotating the turbine shaft and thus driving the generator which is attached to it.

To make further use of the steam it is returned to the boiler and again reheated to 1000°F. It is then passed through the re-

maining cylinders of the turbine, at each stage producing additional mechanical power to spin the generator.

Once the steam has completed this cycle, it is cooled by water from the lake and pumped back to the boiler as water to begin another cycle.

The mechanical energy produced by passing high pressure steam through the turbines drives the generators at either 3,600 r.p.m. (units 7 and 8) or 1,800 r.p.m. and is converted into electrical energy for transmission to the user over Ontario Hydro's high voltage network. Each of the eight generating units at Lakeview has an electrical power output of 300,000 kilowatts at full capacity. At full power, each unit will burn 103 tons of coal per hour.



Lakeview

During the last half century, Ontario Hydro has progressively harnessed the water-power resources of the province and today operates hydro-electric plants on the major rivers. Only a few river sites remain which could be considered capable of economic development to produce electricity.

To keep pace with the expanding Ontario economy it will be necessary for Hydro to more than double its present generating capacity by 1980. Ontario Hydro will meet these future power requirements by constructing large-scale thermal-electric plants, coal-and-oil fired and nuclear. Lakeview generating station is among the largest coal-fired stations in North America. With a total capacity of 2,400,000 kilowatts — greater than the combined output of the Canadian plants at Niagara — it can produce enough power to meet the requirements of 1.6 million homes.

Electricity from Lakeview is fed into Ontario Hydro's high voltage network which serves power users across the province.

Facts About Lakeview

Construction started in June 1958. 1st unit produced power in October 1961. 8th unit produced power in December 1968.

Cost: \$274,000,000

Principal Structures: Powerhouse... Length, 1,200 feet; height, 190 feet; width, 293 feet. Superstructure is of steel frame construction with masonry curtain walls and insulated aluminum siding.

Electrical Power: Total station capacity 2,400,000 kilowatts. Electricity is generated at 16,000 and 18,000 volts and transmitted to the Ontario Hydro grid at 230,000 volts.

Steam Generators: The eight single-furnace boilers are capable of producing 2,000,000 pounds of steam per hour with superheat and reheat temperatures of 1,000 degrees Fahrenheit. Each unit, together with its suspension and supporting platforms, occupies a space approximately 190 feet high, 70 feet wide, and 40 feet deep.

Turbine Generators: The first two 300,000-kilowatt turbo-generators are cross-compound impulse reaction machines with one stage of reheat. Each line drives a 150,000-kilowatt, 16,000-volt generator. The other six units are tandem compound machines, with a single line driving a 300,000-kilowatt, 18,000-volt generator.

Lakeview is operated by a staff of approximately 330.

Dock Facilities

The dock for coal-carrying ships extends over 2,000 feet off shore. Two self-unloading vessels of 27-foot draft and up to 750 feet in length discharge coal simultaneously.

Coal Handling

Self-unloading ships discharge coal through hoppers to two conveyor belts which have a total capacity of 5,000 tons an hour. These conveyors feed an open storage area which has a capacity of 2,500,000 tons. From the coal storage pile two smaller conveyors with capacities of 1,000 tons an hour each transport the coal to bunkers inside the station. At full load the eight units consume a total of 824 tons of coal an hour.

Water Circulation

Like other Ontario Hydro thermal stations, Lakeview has two separate water systems — a closed system within the plant to produce steam, and a flow-through system using Lake Ontario water for cooling. Clean water for condenser cooling purposes is drawn from the lake at a depth of some 20 feet by means of an open-cut intake. Water is pumped to the condensers through concrete pipes, eight feet in diameter, and is returned to the lake, unpolluted, through a similar system. At full operation, the plant requires 1,000,000 gallons of water a minute for cooling purposes.

Air Quality Controls

No thermal-electric generating station can be operated without some effect on the immediate environment. But at Lakeview as at other Ontario Hydro thermal stations every practical step has been taken to minimize pollution. Approximately \$11 million has been spent for this purpose at Lakeview. Electrostatic precipitators designed to remove up to 99.5 per cent of fly ash particles are installed. Chimneys 490 feet high disperse flue gases high into the upper atmosphere.